

THERE IS CLAIMED:

1. A method of fabricating a graded index plastics material optical fiber whose refractive index varies between its center and its periphery, said method comprising the following process steps:

preparing at least two liquid compositions with different refractive indices, each composition comprising at least one polymer, a substance adapted to vary the refractive index being present in at least one of said compositions and a cross-linking starter being present in at least one of said compositions;

filling a preform formation system with said compositions;

producing a liquid preform in said system, the refractive index of said preform having a given gradient; and

drawing said preform to obtain a graded index plastics material optical fiber, in which method the production of the preform comprises a step with substantially no flow of said compositions along said system.

2. The method claimed in claim 1, of fabricating a graded index plastics material optical fiber, wherein said step with substantially no flow includes a step of obtaining a diameter of the preform compatible with said drawing.

3. The method claimed in claim 1, of fabricating a graded index plastics material optical fiber, wherein the production of said preform includes said step substantially without flow followed by a step of obtaining a radial dimension of said preform compatible with said drawing.

4. The method claimed in claim 1, of fabricating a graded index plastics material optical fiber, wherein said filling step is such that said compositions are separated in said preform formation system and the production of said discontinuously graded index (stepped index) preform includes bringing said compositions into contact.

5. The method claimed in claim 1, of fabricating a graded index plastics material optical fiber, wherein the production of said continuously graded index preform includes changing the distribution between the center and the periphery of said preform of at least one of the constituents of at least one of said compositions by mechanical treatment preferably chosen from rotation and vibration.

6. The method claimed in claim 1, of fabricating a graded index plastics material optical fiber, wherein drawing is preceded by controlled pressurization of said preform formation system either by injecting a compressed neutral gas into said system or by actuating a piston in said system.

7. A preform formation system for implementing a method as claimed in claim 1, of fabricating a graded index plastics material optical fiber, said system containing a first area for isolating said compositions during said filling and a second area for formation of said graded index preform, in which system said first area and said second area have at least one common portion.

8. The preform formation system claimed in claim 7, comprising as many concentric enclosures of given axis

and given internal dimensions as there are compositions to be injected, the external enclosure being extended axially by a member with varying internal dimensions and the internal enclosure(s) being removable and longer than said external enclosure.

9. The preform formation system claimed in claim 7, comprising means for applying mechanical treatment to said compositions chosen from vibration means and rotation means.

10. The preform formation system claimed in claim 9, wherein said vibration means comprise an ultrasound transducer connected to a probe.

11. The preform formation system claimed in claim 7, comprising as many concentric enclosures with a given axis and given internal dimensions as there are compositions to be injected, the external enclosure being extended axially by a member with varying internal dimensions and the internal enclosure(s) being removable and longer than said external enclosure, and a drawing member which receives axially said member with varying internal dimensions and contains a removable closure member.